UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,967	01/02/2004	Qi Yu	USP2141A-BDP	9684

30265 7590 10/12/2005

RAYMOND Y. CHAN
108 N. YNEZ AVE., SUITE 128
MONTEREY PARK, CA 91754

EXAMINER	
BOWERS, NATHAN ANDREW	
ART UNIT	**PAPER NUMBER**
1744	

DATE MAILED: 10/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/749,967	YU, QI	
	Examiner	Art Unit	
	Nathan A. Bowers	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1) Claims 1, 2, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wey (US 20050061157 A1) in view of Mager (6790273 B2).

Wey discloses an adhesive sticker that can be attached to a beverage serving means. Paragraph [0032] states that the sticker contains a far infrared ray emitting material (Figure 1:11) comprised of a ceramic powder. The sticker is intended to be attached to a water bottle, as shown in Figure 3. Paragraph [0033] teaches that self-adhesive infrared radiating device can be placed on any beverage serving means. It is an intrinsic feature of this invention that the sticker may be placed on the cap portion of a bottle containing a detachably sealing cap. In this way, the sticker acts as a coating that may be attached to the exterior surfaces of the bottle. Paragraph [0035] states that transition metal oxides, such as titanium oxide, are added to the ceramic powder. However, Wey does not expressly disclose that these titanium oxide particles are characterized as having nanometer dimensions.

Mager discloses a coating containing ultraviolet light absorbers for the long-term protection of plastic materials. In column 2, lines 51-58 and throughout the reference, Mager teaches that nano cerium oxide particles may be integrated into various

polymers to form coatings that are capable of protecting objects from photochemical degradation. In column 1, lines 35-39, Mager discloses that titanium oxides have the same advantages as cerium oxides, in that they are effective UV absorbers and are not leached out or discharged under thermal loads.

Wey and Mager are analogous art because they are from the same field of endeavor regarding coatings comprising titanium oxide that may be applied to plastic containers.

At the time of the invention, it would have been obvious to expand the infrared emitting sticker disclosed by Wey from an isolated patch located on a plastic bottle to an all-inclusive coating containing nano titanium oxide particles. In column 7, lines 6-30, Mager teaches that nano metal oxide coatings are highly transparent, and therefore are good to use in conjunction with transparent plastics. In this way, plastic bottles would gain the benefit of long-term protection from UV radiation when encompassed by a titanium oxide coating.

2) Claims 3, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wey (US 20050061157 A1) in view of Mager (6790273 B2) as applied to claims 1 and 2, and further in view of Watannabe (US 6296943 B1).

Wey and Mager disclose the apparatus set forth in claims 1 and 2 as set forth in the 35 U.S.C. 103 rejection above, however do not expressly disclose that the protective arrangement is an aqueous coating comprising 5% far infrared ray emitter and nano titanium oxide by weight and 95% water by weight.

Watannabe discloses that a method for producing a titanium oxide composite sol that may be applied as a coating to plastics, glass, and ceramics. In column 5, lines 38-39 and column 14, line 65 to column 15, line 62, Watannabe states that titanium oxide particles 2-20 nm in size are used in making the coating, and that other metal oxides may be incorporated in order to insure that the coating is capable of blocking UV rays without resulting in a color change. Column 23, line 38 to column 24, line 17 teaches a method for manufacturing the coating in which an aqueous coating containing around 5% titanium oxide by weight is formed (step b-d). Routine experimentation would allow for one of ordinary skill in the art to determine an optimum titanium oxide weight percentage. Although Watannabe goes on the state that the water is substituted by methanol to form the finished coating (step e), this step is not essential for the formation of a functional coating. Watannabe's product that is around 5% by weight titanium oxide and the majority water, and a coating that is 5% titanium oxide and 95% water are not identical, but are similar in that that one of ordinary skill in the art would have expected them to have the same properties, according to *Titanium Metals Corp. of America v. Banner,* 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Wey, Mager, and Watannabe are analogous art because they are from the same field of endeavor regarding coatings for plastics containing titanium oxide.

At the time of the invention, it would have been obvious to produce the coating containing nano titanium oxide and infrared emitting ceramics disclosed by Wey and Mager so that it infrared emitter and nano titanium oxide constituted 5% by weight and water the remaining 95%. Watannabe states in column 7, lines 4-10 that this amount is

effective because coatings containing a smaller concentration of "active components" are poor in efficiency and uneconomical, whereas coatings containing higher concentrations are undesirable because the viscosity of the coating becomes too large. Furthermore, coatings containing higher amounts of titanium oxide and infrared emitter are unlikely to experience significant increases in germ inhibition and UV protection.

3) Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wey (US 20050061157 A1) in view of Mager (6790273 B2) as applied to claims 1 and 2, and further in view of Andrews (US 20050171253 A1).

Wey and Mager disclose the apparatus set forth in claims 1 and 2 as set forth in the 35 U.S.C. 103 rejection above, however do not expressly disclose that the protective arrangement of titanium oxides and infrared emitting ceramics is integrally mixed with a plastic material to integrally form a container body. Wey and Mager do not disclose that the infrared ray emitter and nano titanium oxide are in a 1:10,000 weight ratio with the plastic material of the liquid container.

Andrews discloses a method for forming plastic containers that are comprised of various ultraviolet-absorbing moieties in order to protect foodstuffs and beverages from the deleterious effects of UV radiation. The UV absorbers are integrally mixed with the plastic material to integrally form the container body. This is disclosed in paragraph [0001] and paragraphs [0024] through [0028]. Although Andrews specifically teaches that hydroxyphenylbenzotriazole molecules are used as UV absorbers, it is taught in paragraph [0249] that titanium oxide still may be incorporated into the plastic material of

the container. In paragraph [0202], it is disclosed that the added UV blockers are in a 1:10,000 weight ratio (0.01%) with plastic container material.

Wey, Mager, and Andrews are analogous art because they are from the same field of endeavor regarding the addition of titanium oxides and/or UV absorbing compounds to plastic containers.

At the time of the invention, it would have been obvious to integrally mix the titanium oxide and infrared emitting powder protective arrangement disclosed by Wey and Mager with the plastic material of the container body, rather than simply forming a protective film upon the plastic material of the container body. Andrews demonstrates in paragraph [0032] that many types of UV absorbers exhibit excellent compatibility with plastic containers, in that they can be easily chemically linked to the plastic polymers and add little or no color to the finished plastic containers. Mager teaches in column 1, lines 35-39 that titanium oxides are effective UV absorbers to be incorporated into plastics since they are not leached out or discharged under thermal loads. It would have been apparent to add the titanium oxide and infrared ray emitter protective arrangement mix at the same 1:10,000 weight ratio disclosed by Andrews, especially since his UV absorbers and the protective arrangement mixture disclosed by Wey and Mager essentially perform identical tasks by preventing excess ultraviolet light from entering the plastic container. This concentration is beneficial because it provides for UV blocking and infrared emitting compounds scattered throughout the plastic in an amount that is high enough to be effective. Furthermore, the concentration is not so

high that it is still possible to attain significant increases in performance corresponding to increases in concentration, because the plastic is not saturated with additives.

4) Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watannabe (US 6296943 B1) in view of Wey (US 20050061157 A1) and Mager (6790273 B2).

Watannabe discloses a method for manufacturing a coating to be applied to plastics, glass, and ceramics. The coating is comprised of nano titanium oxide particles, as well as other nano metal oxide particles, that function to shield a substrate upon which they are applied from ultraviolet radiation. This is taught in column 5, lines 38-39 and column 14, line 65 to column 15, line 62. In column 23, line 38 to column 24, line 17, Watannabe states that the titanium oxide and other metal oxides are mixed together to form a sol that is mostly water and approximately 5% titanium oxide by weight. Routine experimentation would allow for one of ordinary skill in the art to determine an optimum titanium oxide weight percentage. Although Watannabe goes on the state that the water is substituted by methanol to form the finished coating (step e), this step is not essential for the formation of a functional coating. However, Watannabe does not expressly disclose that the coating is applied to a plastic liquid container comprising a detachably sealing cap, or that the nano titanium oxide particles are mixed with a far infrared ray emitting ceramic powder in order to form an anti-germ solution.

Wey discloses in paragraph [0033] an adhesive sticker that can be attached to an assortment of beverage serving means, including plastic bottles (Figure 3) comprising detachably sealing caps. Paragraph [0032] states that the sticker contains a

far infrared ray emitting material (Figure 1:11) comprised of a ceramic powder. In this way, the sticker acts as a coating that may be attached to the exterior surfaces of the bottle. Paragraph [0035] states that transition metal oxides, such as titanium oxide, are added to the ceramic powder. It is an intrinsic property that any far infrared light emitter, such as the ceramic powder disclosed by Wey, would exhibit some degree of biocidal activity.

Mager discloses a coating containing ultraviolet light absorbers for the long-term protection of plastic materials. In column 2, lines 51-58 and throughout the reference, Mager teaches that nano cerium oxide particles may be integrated into various polymers to form coatings that are capable of protecting objects from photochemical degradation. In column 1, lines 35-39, Mager discloses that titanium oxides have the same advantages as cerium oxides, in that they are effective UV absorbers and are not leached out or discharged under thermal loads.

Wey, Mager, and Watannabe are analogous art because they are from the same field of endeavor regarding coatings for plastics containing titanium oxide.

At the time of the invention, it would have been obvious to alter the method disclosed by Watannabe in order to add far infrared emitting ceramic powder to the disclosed titanium oxide coating solution so that the additives (titanium oxide and ceramic powder) would still make up approximately 5% of the coating by weight. It would have furthermore been obvious to use Watannabe's method for producing a coating to develop a method for producing a plastic bottle that incorporates the disclosed coating. Mager teaches in column 7, lines 6-30 that nano titanium oxide

solutions are able to effectively form UV absorbing coatings over the exterior surfaces of a number of different plastic containers. In paragraph [0035], Wey teaches that metal oxides are capable of forming effective coatings and barriers around plastic bottles when combined with ceramic far infrared emitting particles. This is due to the fact that the ceramic and titanium oxide particles form bacteria inhibiting and UV blocking components, and also serve to irradiate beverages within the plastic bottles with infrared emissions in order to effectively improve the beverage's taste. This is taught by Wey in paragraphs [0001] to [0012].

5) Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watannabe (US 6296943 B1) in view of Wey (US 20050061157 A1) and Mager (6790273 B2) as applied to claims 11 and 12, and further in view of Andrews (US 20050171253 A1).

Watannabe, Wey, and Mager disclose the method set forth in claims 11 and 12 as set forth in the 35 U.S.C. 103 rejection above, however do not do not expressly disclose that the protective arrangement of titanium oxides and infrared emitting ceramics is integrally mixed with a plastic material to integrally form a container body. Watannabe, Wey, and Mager do not disclose that the infrared ray emitter and nano titanium oxide are in a 1:10,000 weight ratio with the plastic material of the liquid container.

Andrews discloses a method for forming plastic containers that are comprised of various ultraviolet-absorbing moieties in order to protect foodstuffs and beverages from the deleterious effects of UV radiation. The UV absorbers are integrally mixed with the

plastic material to integrally form the container body. This is disclosed in paragraph [0001] and paragraphs [0024] through [0028]. Although Andrews specifically teaches that hydroxyphenylbenzotriazole molecules are used as UV absorbers, it is taught in paragraph [0249] that titanium oxide still may be incorporated into the plastic material of the container. In paragraph [0202], it is disclosed that the added UV blockers are in a 1:10,000 weight ratio (0.01%) with plastic container material.

Watannabe, Wey, Mager, and Andrews are analogous art because they are from the same field of endeavor regarding the addition of titanium oxides and/or UV absorbing compounds to plastic containers.

At the time of the invention, it would have been obvious to integrally mix the titanium oxide and infrared emitting powder protective arrangement disclosed by Watannabe, Wey, and Mager with the plastic material of the container body, rather than simply forming a protective film upon the plastic material of the container body. Andrews demonstrates in paragraph [0032] that many types of UV absorbers exhibit excellent compatibility with plastic containers, in that they can be easily chemically linked to the plastic polymers and add little or no color to the finished plastic containers. Mager teaches in column 1, lines 35-39 that titanium oxides are effective UV absorbers to be incorporated into plastics since they are not leached out or discharged under thermal loads. Watannabe teaches also teaches that nano titanium oxides are effective UV blockers in column 14, line 65 to column 15, line 62. It would have been apparent to add the titanium oxide and infrared ray emitter protective arrangement mix at the same 1:10,000 weight ratio disclosed by Andrews, especially since his UV absorbers and the

protective arrangement mixture disclosed by Watannabe, Wey, and Mager essential perform identical tasks by preventing excess ultraviolet light from entering the plastic container. This concentration is beneficial because it provides for UV blocking and infrared emitting compounds scattered throughout the plastic in an amount that is high enough to be effective. Furthermore, the concentration is not so high that it is still possible to attain significant increases in performance corresponding to increases in concentration, because the plastic is not saturated with additives.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Taoda (US 5943950) and Jacobson (US 5503840) references show the state of the art regarding the use of titanium oxide coatings on plastic water bottles. The Rakhimov (US 5350927), Jong (US 5643489), and Yang (US 5891331) references show the state of the art regarding the use of far infrared ray emitting materials, and the Yumoto (US 5684079) reference speaks of a relevant curing/coating composition.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A. Bowers whose telephone number is (571)272-8613. The examiner can normally be reached on Monday-Friday 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sun (John) Kim can be reached on (571)272-1142. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KRISANNE JASTRZAB
PRIMARY EXAMINER

NAB

October 7, 2005